

Abstract Submitted
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Specifics of nanostructure stability patterned polystyrene under high electric fields SERGEI LYUKSYUTOV, VICTORIA NEDASHKIVSKA, Department of Physics University of Akron OH, MINDAUGAS RACKAITIS, 2Bridgestone Americas, Center for Research and Technology, Akron OH — The stability of nanostructures patterned in annealed polystyrene films exposed to electric fields of 10^9 - 10^{10} V m⁻¹ suggests slow exponential relaxation (τ = between 55 and 160 hours) while relaxation in non-annealed surface occurs on a scale of minutes. A lithography protocol was designed for fast formation of nanostructures 30-100 nm in width and 1-10 nm in height in the films thicker than 100 nm. After more than 300 hours of observation under humidity varied between 25 and 27%, it was suggested that the major factor of slow dynamical changes of the nanostructures attributed to electric charge dissipation. It is suspected that slow relaxation of the nanostructures is not related to the glass transition in 150-nm thick polymer films.

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